

7-7 Operations on Functions

Test
Thursday

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$f(-1) = -4$$

$$g(-1) = 2$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$\text{SUM} \quad (f + g)(x) = f(x) + g(x)$$

$$(f + g)(x) = 3x^2 + 7x + 2x^2 - x - 1 \\ = 5x^2 + 6x - 1$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$\text{Difference} \quad (f - g)(x) = f(x) - g(x)$$

$$(f - g)(x) = 3x^2 + 7x - (2x^2 - x - 1) \\ 3x^2 + 7x - 2x^2 + x + 1 \\ x^2 + 8x + 1$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

$$\text{Product} \quad (f \cdot g)(x) = f(x) \cdot g(x)$$

$$(f \cdot g)(x) = (3x^2 + 7x)(2x^2 - x - 1) \\ 6x^4 - 3x^3 - 3x^2 + 14x^3 - 7x^2 - 7x \\ (f \cdot g)(x) = 6x^4 + 11x^3 - 10x^2 - 7x$$

$$f(x) = 3x^2 + 7x$$

$$g(x) = 2x^2 - x - 1$$

Quotient $\left(\frac{f}{g}\right)x$ $\div g(x)$

$$\frac{3x^2 + 7x}{2x^2 - x - 1} \quad x \neq 1, x \neq -\frac{1}{2}$$

$$(2x+1)(x-1)$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](x) = f[g(x)] \quad f(x-4)$$

$$= 3(x-4)^2 - 2(x-4) + 1$$

$$= 3(x^2 - 8x + 16) - 2x + 8 + 1$$

$$= 3x^2 - 24x + 48 - 2x + 8 + 1$$

$$= 3x^2 - 26x + 57$$

$$[g \circ f](x) = g[f(x)]$$

$$(3x^2 - 2x + 1) - 4$$

$$3x^2 - 2x - 3$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](3) = g(3)$$

$$= f(-1)$$

$$= 6$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](7) = 7 - 4 = 3$$

$$f(3)$$

$$= 22$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[g \circ f](3) =$$

$$g(22) \\ = 18$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$g[f(2)] =$$

$$g(9) \\ = 5$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[f \circ g](x) = f[g(x)]$$

Composition of Functions

$$f(x) = 3x^2 - 2x + 1$$

$$g(x) = x - 4$$

$$[g \circ f](x) = g[f(x)]$$

Sets

$$f = \{(2,6) (9,4) (7,7) (0, -1)\}$$

$$g = \{(7,0) (-1,7) (4,9) (8,2)\}$$

$$f \circ g = \{(7,-1) (-1,7) (4,4) (8,6)\}$$

Sets

$$f = \{(2,6) (9,4) (7,7) (0, -1)\}$$

$$g = \{(7,0) (-1,7) (4,9) (8,2)\}$$

$$g \circ f = \{(9,9) (7,0) (0,7)\}$$

DO:

$$f = \{(8,9) (6,4) (10,9) (12,6)\}$$

$$g = \{(6,8) (4,6) (8,9) (9,12)\}$$

$$f \circ g =$$

$$g \circ f =$$

Hw

p387-388

17, 20, 23-31 odd

35, 41, 45